Paper 1 B1F Mark scheme

Question number	Answer	Mark
1(a)	A completed Punnett square, including: • offspring alleles correct (1) man 		B	B
b	Bb	Bb | woman | b	Bb	Bb | • phenotype of child: brown eyes (1)	**(2)**

Question number	Answer	Additional guidance	Mark
1(b)(i)	• All four columns correct (tally and total) (2) • One or two correct columns (1)	blue: 9 brown: 14 green: 3 hazel: 4	**(2)**

Question number	Answer	Mark
1(b)(ii)	Could be displayed as a bar chart/pie chart	**(1)**

Question number	Answer	Mark
1(c)(i)	C	**(1)**

Question number	Answer	Additional guidance	Mark
1(c)(ii)	Any one from: • mutation in the base sequence (1) • different base sequence (1) • different sequence length (1)	different amino acid sequence	**(1)**

Question number	Answer	Mark
1(d)(i)	To remove insoluble material	**(1)**

Question number	Answer	Mark
1(d)(ii)	D	**(1)**

Question number	Answer	Mark
2(a)	A	(1)
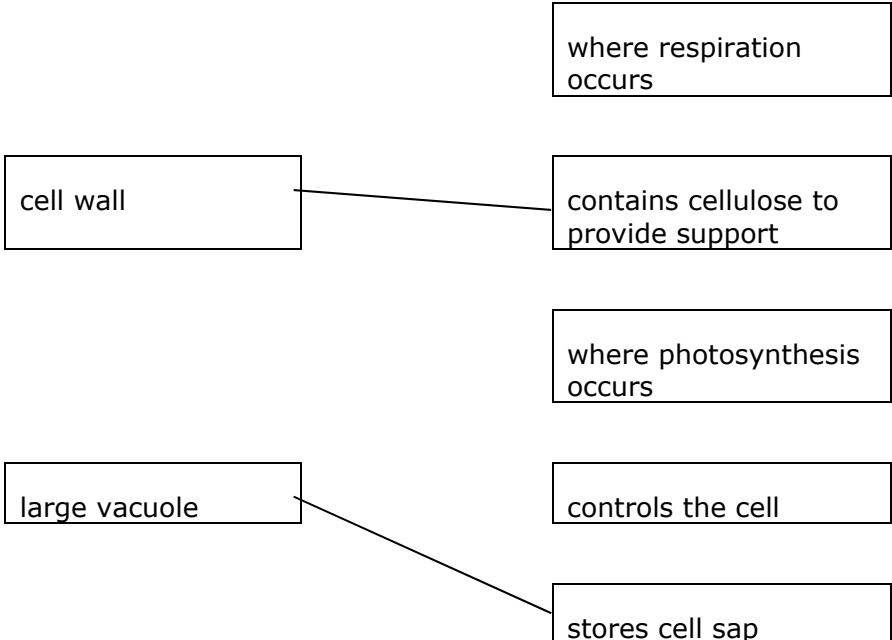
Question number	Answer	Mark
2(b)(i)	2009 bar plotted at 4800 and 2010 bar plotted at 4100	(1)

Question number	Answer	Additional guidance	Mark
2(b)(ii)	An answer that combines points of interpretation/evaluation to provide a logical description: • overall trend increases until 2009 (1) • decrease in the number of cases in 2010/correct manipulation of the data (1)	e.g. in 2010 it decreased by 700 cases (1)	(2)

Question number	Answer	Mark
2(b)(iii)	An explanation that combines identification – understanding (1 mark) and reasoning/justification – understanding (1 mark): • chlamydia and gonorrhoea are STI infections spread by the same mechanism (1) • individuals aren't using a barrier contraception method (1)	(2)

Question number	Answer	Mark
2(c)	An explanation that combines identification – knowledge (1 mark) and reasoning/justification – understanding (1 mark): • HIV destroys white blood cells/cells of the immune system (1) • therefore a reduced immune response makes the individual more susceptible to other communicable diseases (1)	(2)

Question number	Answer	Mark
3(a)(i)	C	**(1)**

Question number	Answer	Mark
3(a)(ii)	One mark for each correct line	**(2)**

Question number	Answer	Mark
3(b)(i)	C	**(1)**

Question number	Answer	Additional guidance	Mark
3(b)(ii)	5 (µm) ± 1.5	approximately a third of the diameter of the cell	**(1)**

Question number	Answer	Mark
3(b)(iii)	0.015 (mm)	**(1)**

Question number	Answer	Additional guidance	Mark
3(c)	An explanation that combines identification – application of knowledge (1 mark) and reasoning/justification – application of understanding (2 marks): • higher magnification can be used (1) • so the cilia are more visible (1) • and the sub-cellular structures are visible (1)		**(3)**

Question number	Answer	Mark
4(a)(i)	23 (chromosomes)	**(1)**

Question number	Answer	Additional guidance	Mark
4(a)(ii)	6600 million ÷ 100 (1) × 35 = 2310 million (1)	award full marks for correct numerical answer without working	**(2)**

Question number	Answer	Mark
4(b)(i)	An explanation that combines identification – understanding (1 mark) and reasoning/justification – understanding (1 mark): • one cell produces two daughter cells for every division by mitosis (1) • two cell division steps produces four cells (1)	**(2)**

Question number	Answer	Mark
4(b)(ii)	C	**(1)**

Question number	Answer	Mark
4(c)(i)	An answer that combines knowledge (1 mark) and understanding (2 marks) to provide a logical description: • place the slide on the stage of the microscope and look through the eyepiece lens (1) Plus two from: • turning the focusing wheel/knob will obtain a clear image (when looking through the eyepiece lens) (1) • start by using the lowest objective lens magnification (1) • increase the magnification of the objective lens and refocus (1)	**(3)**

Question number	Answer	Mark
4(c)(ii)	Use a stain (1)	**(1)**

Question number	Answer	Mark
5(a)(i)	• 4.6 million – 4.4 million (1) • 0.2 million years/200 000 years (1)	**(2)**

Question number	Answer	Additional guidance	Mark
5(a)(ii)	An answer that combines knowledge (1 mark) and understanding (1 mark) to provide a logical description: • (scientists might look for) differences in the structural features of the fossil (1) • and *Ardipithecus ramidus* would be deeper in the rock layer than *Homo* {*habilis*/stone tools} (1)	e.g. *Ardipithecus ramidus* smaller cranial capacity	**(2)**

Question number	Answer	Additional guidance	Mark
5(a)(iii)	An explanation that combines identification – application of knowledge (1 mark) and reasoning/justification – application of understanding (1 mark): • likely to be out-competed by *Homo erectus* (1) • {for resources essential for survival/due to the presence of a new selection pressure} (1)	accept: named resources accept: named selection pressure, e.g. climate change, environmental change, disease	**(2)**

Question number	Answer	Additional guidance	Mark
5(a)(iv)	An explanation that combines identification via a judgement (1 mark) to reach a conclusion via justification/reasoning (1 mark): • stone tool B because it is more {sophisticated/worked} (1) • and *Homo erectus* lived more recently than *Homo habilis* (1)	accept: data quoted from the timeline	**(2)**

Question number	Answer	Mark
5(b)	An answer that combines the following points of application of knowledge and understanding to provide a logical description: • genetic variation means that some plants will be tolerant of drought conditions and these can be selected (1) • cross-pollinate these plants and grow the seeds under drought conditions (1) • select offspring and repeat over several generations (1)	**(3)**

Question number	Answer	Additional guidance	Mark
6(a)	• 830 mm = 0.83 m (1) • 0.83/0.99 = 0.8383… = 0.84 to two d.p. (1) OR • 0.99 m = 990 mm (1) • 830/990 = 0.8383… = 0.84 to two d.p. (1) Answer must be given to 2 decimal places	award full marks for correct numerical answer without working	**(2)**

Question number	Answer	Mark
6(b)(i)	Any two of the following points: • similar BMI (1) • same gender profile (1) • similar amount (and type) of exercise (1)	**(2)**

Question number	Answer	Mark
6(b)(ii)	An answer that combines the following points to provide a plan: • weigh the 40 obese people (1) • half follow the new diet and half keep their normal diet (1) • after a fixed time period re-weigh the 40 people (1)	**(3)**

Question number	Indicative content	Mark
*6(c)	Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme. The indicative content below is not prescriptive and candidates are not required to include all the material which is indicated as relevant. Additional content included in the response must be scientific and relevant. **AO2 (3 marks) and AO3 (3 marks)** AO3: Interpretation and evaluation from the graph • the trend is downwards • women are less likely to smoke than men • the trend for men is decreasing more steeply than for women • the decreasing trend in smoking should lead to a decrease in the occurrence in cardiovascular disease • the decrease of cardiovascular disease in men would be greater than in women AO2: Link between reducing smoking and cardiovascular disease: • less damage to alveoli so reduced effect on surface area of lungs • less fatty deposits build up in arteries so less chance of a heart attack or stroke • effect of nicotine raising heart rate and blood pressure is reduced • the risk of blood clotting is reduced so lower chance of heart attack or stroke	**(6)**

Level	Mark	Descriptor
	0	No awardable content.
Level 1	1–2	• Interpretation and evaluation of the information attempted but will be limited with a focus on mainly just one variable. Demonstrates limited synthesis of understanding. (AO3) • The explanation attempts to link and apply knowledge and understanding of scientific ideas, flawed or simplistic connections made between elements in the context of the question. (AO2)
Level 2	3–4	• Interpretation and evaluation of the information on both variables, synthesising mostly relevant understanding. (AO3) • The explanation is mostly supported through linkage and application of knowledge and understanding of scientific ideas, some logical connections made between elements in the context of the question. (AO2)
Level 3	5–6	• Interpretation and evaluation of the information, demonstrating throughout the skills of synthesising relevant understanding. (AO3) • The explanation is supported throughout by linkage and application of knowledge and understanding of scientific ideas, logical connections made between elements in the context of the question. (AO2)